Bullseye

# The Genetic Disaster

## How Islam Ignores the Risks of Consanguineous Marriages

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BULLSEYE

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# 1. Introduction

In 1839, the well known Biologist and Naturalist, Charles Darwin got married to his first cousin, Emma Wedgwood. Although their marriage was loving and long-lasting, Darwin became increasingly worried about the health of his children, three of whom died young, and others suffered illnesses. In a letter that Darwin wrote to his daughter, he himself admitted that the subject of cousin marriage was doubtful and obscure. Since Darwin had studied inbreeding and crossbreeding in plants and animals, discovering that close inbreeding often led to weaker offspring, he feared that such harmful traits hidden in both families could appear in children too. He also wrote that while ordinary cousin marriages might not cause serious harm, the children of unrelated parents were usually stronger and healthier. He then goes on to warn that double cousins were at a much higher risk.[1]

Following is the full text of Darwin's letter to his daughter Henrietta, written on 10 February 1872:

To H. E. Litchfield  10 February 1872

*Down, | Beckenham, Kent.*

Feb 16th.—/72

My dear Henrietta

*The subject is doubtful & obscure. In the marriage of cousins there is obviously danger from evils, possibly latent on both sides, being developed in the offspring. As far as mere consanguinity is concerned, judging from the analogy of animals, I sh*d*. think no direct evil would follow from the marriage of cousins. Nevertheless I sh*d*. quite expect that if all the offspring of cousins throughout England could be compared with the offspring from parents not related, that the latter would be somewhat superior in size, & vigour  On the other hand, my recent observations lead me to conclude that if two cousins had long lived at some distance from each*

[1] Charles Robert Darwin, *Letter to Henrietta Litchfield*, 10 February 1872, DCP-LETT-8207, Darwin Correspondence Project

*other, & had consequently been exposed to somewhat different conditions of life, this would counterbalance any slight evil from their consanguinity.— I do not know of any reason whatever to lead to the belief that the marriage of cousins on male or female side would be more injurious, one than the other.— Double cousins, (i.e. from 2 brothers marrying 2 sisters) would of course be more nearly related than ordinary cousins, & I sh$^{d}$. expect that their offspring would tend to suffer more.— Under our present state of knowledge the injury from the increase of any bad tendency common to the family seems to me more to be feared than that from mere consanguinity; though the good effects of crossing distinct families I look at as great & undoubted.*

Yours affectionately | Ch. Darwin

Almost 130 years after Darwin's death, a team of experts in evolution and genetics revisited the question he worried about himself. Their conclusion? His close genetic relationship with his wife likely contributed to the poor health of some of their children. Not only were Darwin and Emma first cousins, but Darwin's own maternal grandparents were third cousins. The researchers found that about 6.3% of the children's DNA came from the same sequences inherited from both parents. This overlap would have increased the risk of health problems that only appear when a child inherits the same faulty gene from both mother and father. It may also help explain the unusually high rate of infertility among Darwin's adult children, according to the study.[2]

In 2009, scientists discovered that inbreeding can make children more susceptible to infectious diseases.[3] This may explain why Anne Elizabeth died from childhood tuberculosis, and Charles Waring died of scarlet fever. Thus Charles Darwin's fear of consanguinity appears to have been justified, the researchers concluded. There are even some early Greek philosophers who discussed inbreeding. One example is Aristotle (384-322 BCE), who in History

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[2] *Biological Journal of the Linnean Society*, Volume 121, Issue 2, 1 June 2017, Pages 458–468

[3] Lyons, Emily J et al. "*Consanguinity and susceptibility to infectious diseases in humans.*" *Biology letters* vol. 5,4 (2009): 574-6

of Animals, records a story in which camels and horses instinctively avoided mating with their mothers, even when humans tried to deceive them. In one case, a camel, once it realized the trick, turned on the driver and killed him. In another, a horse, upon discovering it had been forced to mate with its own mother, threw itself down a cliff.[4] Aristotle presents these anecdotes to illustrate how even animals resist incestuous unions. This behavior isn't limited to camels and horses. Studies on primates show that when female outsiders are present, males instinctively avoid mating with females from their own group. But when outside partners aren't available, they may resort to mating with related females within the group.[5]

Even though Darwin's personal experience portrays the potential dangers of marrying close relatives, modern genetics provides a standard way to understand these risks. There are concepts like consanguinity, inbreeding, inbreeding coefficient… which allows scientists to predict how different types of marriages affect the offspring. Yet, Islam completely ignores these distinctions. In this work, not only will I show that Islam finds no issue with ordinary cousin marriages, but also permits situations where the genetic risks to the offspring can become strikingly higher.

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[4] Aristotle, *History of Animals*, Book IX, Chapter XXXIV. (London: George Bell, 1883), p. 274

[5] Wolf, Arthur P.; William H. Durham (2004). *Inbreeding, Incest, and the Incest Taboo: The State of Knowledge at the Turn of the Century*. Stanford University Press. p. 6.

# 2. Genetics 101: Understanding Consanguinity and Inbreeding

To understand the genetic implications of different types of marriages, it's important for us to define some basic concepts first.

**Consanguinity:** The word consanguinity comes from the Latin word *consanguineus,* meaning 'of the same blood' which implied that Roman individuals traced back to the same father, and therefore shared the right to his inheritance. Consanguineous kinship includes those with common ancestors and excludes those who lack ancestors in common. From a genetic perspective, consanguinity increases the chances of getting the same copy of a gene[6] from both parents. The genes that get passed down, which are made of DNA[7] contain the instructions for making proteins[8], which are essential for the survival of living organisms. In short, consanguinity means the degree of relatedness.[9]

**Inbreeding:** Inbreeding refers to the mating of individuals or organisms that are closely related through common ancestry. When referring to humans, the term is used to describe mating between couples who share at least one common ancestor. This mating is also referred to as a consanguineous mating. Matings between full siblings, between half siblings, and between first cousins are some examples of inbreeding. When such matings occur, the offspring is described as being inbred. Consanguineous marriages are more likely to produce children who inherit the same version of a gene from both parents, compared to marriages between unrelated individuals. This increase in such identical gene pairs is one of the most noticeable effects of inbreeding.[10]

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[6] *Gene,* Encyclopedia Britannica
[7] *DNA,* Encyclopedia Britannica
[8] *Protein,* Encyclopedia Britannica
[9] *Consanguinity,* Encyclopedia Britannica
[10] Snustad & Simmons (2015), *Principles of Genetics* (7th ed), Chapter 4, pp. 76-78. Wiley.

# 3. Calculating the Risk: The Inbreeding Coefficient (F) and Recessive Genes

The Inbreeding Coefficient (F), a mathematical quantity discovered by Sewall Wright in 1921, is a probability value that quantifies the likelihood of an individual inheriting two identical copies of a gene (alleles) from a common ancestor. The inbreeding coefficient is used to explain the increased frequency of recessive disorders among the offspring of consanguineous matings. Another use of the inbreeding coefficient is to measure the decline in a complex phenotype[11], such as plant height or crop yield. The inbreeding coefficient can also be used to measure the closeness of genetic relationships. The application of this principle can be demonstrated by a simple example. If a brother and sister were to marry, there would be a ¼ or 25% chance that their offspring will get the same version of a gene from both the mother's side and the father's side, this is called being *homozygous* for that gene. F ranges from 0 to 1. 0 means no inbreeding while 1 signifies extreme inbreeding.[12]

**Calculating the Inbreeding Coefficient (F):** To calculate F, we need to follow these steps:

1. Identify the common ancestor: To identify the common ancestor we look at the family tree (pedigree) of the child. Next, we find any ancestors who appear on both the father's and mother's side. These are the common ancestors. For example, if the child's parents are first cousins, their grandparents are the shared ancestors.
2. Then we count the paths from the common ancestor to the child: Each path is a route through which genes could be inherited. We count the number of generations from the common ancestor to the father and mother. Let's call these n1 (the father) and n2 (the mother).

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[11] Phenotype, *Merriam Webster*

[12] Snustad & Simmons (2015), *Principles of Genetics* (7th ed), Chapter 4, pp. 78-81. Wiley.

3. Apply the formula for a single common ancestor: For one common ancestor, the inbreeding coefficient is: F = (1/2)^(n1 + n2 + 1) * (1 + F_A), Where:

- n1 = generations from ancestor to father
- n2 = generations from ancestor to mother
- F_A = inbreeding coefficient of the common ancestor (usually 0 if unknown or assumed unrelated)
- The +1 accounts for the fact that the child receives one allele from each parent

4. Add contributions if there are multiple common ancestors: If there are more than one common ancestor, we need to calculate F for each separately and then add them all together: F_total = F_1 + F_2 + F_3 + …

***Example:*** First cousins share a grandparent. The number of generations from grandparent to each parent are 2 ( grandparent → parent → child). Formula: F = (1/2)^(2 + 2 + 1) * (1 + 0) = (1/2)^5 * 1 = 1/32 = 0.03125. This is the inbreeding coefficient of the child from just one ancestor. Now the same contribution comes from the second common ancestor too, so applying the F_total formula, F_total = 0.03125 + 0.03125 = 0.0625. Hence the inbreeding coefficient for a child of first cousins is 0.0625. That means there's a 1/16 or 6.25% chance the child gets identical copies of a gene from shared grandparents.

***Example 2:*** Brother and sister share both parents so n1 = 1, n2 =1 for each parent, and there are two common ancestors (mother and father). For one common ancestor: F = (1/2)^1+1+1 = (1/2)^3 = 0.125. Since there are two common ancestors (mother + father), we add them: F = 0.125 + .0125 = 0.25. Hence the inbreeding coefficient for a child of siblings is 0.25, meaning there's a 1/4 or 25% chance the child gets identical DNA from both parents due to the siblings' shared ancestry. This is 4 times as high as the inbreeding coefficient for first cousins (6.25%).

In clinical genetics, a relationship is considered consanguineous if the inbreeding coefficient is 0.0156 or more.[13] Below is a table summarizing the

[13] Bittles, A. (2001), *Consanguinity and its relevance to clinical genetics.* Clinical Genetics, 60: 89-98.

major types of consanguineous relationships and their corresponding inbreeding coefficients (F).

*Major Types of Consanguineous Relationship*

| *Family Relationship* | *Genetic Relationship* | *Fraction of Genes in Common* | *Coefficient of Inbreeding (F) in Progeny* |
|---|---|---|---|
| Incestuous | First degree | 1/2 | 0.25 |
| Uncle-niece | Second degree | 1/4 | 0.125 |
| Double first cousin | | 1/4 | 0.125 |
| First cousin | Third degree | 1/8 | 0.0625 |
| First cousin once removed | Fourth degree | 1/16 | 0.0313 |
| Double second cousin | | 1/16 | 0.0313 |
| Second cousin | Fifth degree | 1/32 | 0.0156 |

- **Recessive Genes and why they matter:** Every gene comes in two copies (one from each parent). A recessive gene is a version of a gene that doesn't show its effect if there's a normal copy from the other parent. Many harmful traits are caused by recessive genes. These traits only show up if a child inherits the harmful version from both parents (one from mom, one from dad).If the child inherits just one copy, the normal gene "covers" it, and the child appears healthy. Now inbreeding increases the chance that both parents share the same harmful recessive gene from a common ancestor. This means the child is more likely to inherit two copies, so the harmful trait can appear. A well-known example is sickle cell anemia[14], a severe disorder of hemoglobin[15]. The disease appears only when a child inherits the mutant gene (a) from both parents. In consanguineous marriages, such as between cousins or siblings, there is a higher chance that both parents have inherited the same gene variant from a common grandparent. Because the gene is present in the family line, the probability of it coming together in the child increases from both sides, leading to a greater risk of the disorder.[16]

[14] Sickle cell anemia, *Encyclopedia Britannica*
[15] Hemoglobin, *Encyclopedia Britannica*
[16] Recessiveness, *Encyclopedia Britannica*

# 4. Islam and Consanguinity: A Religious Perspective

In many Muslim societies, marriages between close biological kin are preferential and culturally accepted. Although the rates and types of consanguineous marriages vary by region and culture, marriages between first cousins are particularly common in parts of South Asia and the Middle East.[17] A clear example is Pakistan. National data from the Pakistan Demographic and Health Survey (PDHS) indicates that consanguineous marriages account for roughly 62–63% of all unions and over 80% of those involve first cousins.[18] Other studies estimate that first cousins alone comprise around half of all marriages in Pakistan.[19]

These high rates of cousin marriages are not only cultural but also religiously sanctioned in Islam. In general, Muslim regulations on marriage are the same as Judaic regulations mentioned in Leviticus 18:7-18, apart from the fact that uncle-niece unions are forbidden in the Koran, even though double first cousin marriages, which have the same coefficient of inbreeding (F= 0.125) are not forbidden in the Koran. The Muslim regulations on marriage can be found in Koran 4:23:

**حرمت عليكم أمهاتكم وبناتكم وأخواتكم وعماتكم وخالاتكم وبنات الأخ وبنات الأخت وأمهاتكم اللاتي أرضعنكم وأخواتكم من الرضاعة وأمهات نسائكم وربائبكم اللاتي في حجوركم من نسائكم اللاتي دخلتم بهن فإن لم تكونوا دخلتم بهن فلا جناح عليكم وحلائل أبنائكم الذين من أصلابكم وأن تجمعوا بين الأختين إلا ما قد سلف إن الله كان غفورا رحيما (٢٣)**

**Translation:** Forbidden to you are your mothers and daughters, your sisters, your aunts paternal and maternal, your brother's daughters, your sister's daughters, your mothers who have given suck to you, your suckling sisters, your wives' mothers, your stepdaughters who are in your care being born of your wives you have been in to -- but if you have not yet been in to them it is no fault in you - and the spouses of your sons who are of your loins, and that

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[17] A. H. Bittles, *Empirical Estimates of the Prevalence of Consanguineous Marriage in Contemporary Societies.* Working Report no. 74, Morrison Institute for Population and Resource Studies (Stanford, Calif.: Stanford University, 1998); A. H. Bittles, "Consanguinity," http://www.consang.net (2003).

[18] Hussain, R., & Bittles, A. H. (1998). *The prevalence and demographic characteristics of consanguineous marriages in Pakistan.* Journal of biosocial science, 30(2), 261–275.

[19] Afzal, M., Ali, S. M., & Siyal, H. B. (1994). *Consanguineous marriages in Pakistan.* Pakistan development review, 33(4 Pt 2), 663–674.

you should take to you two sisters together, unless it be a thing of the past; God is All-forgiving, All-compassionate; (Arberry)

As we can see, nowhere does the Koran explicitly forbid union with cousins. The Koran mentions the marriage of Mohammed to Zaynab d. Jahsh in 33:37. According to Sirat Ibn Ishaq, her brother Abu Ahmad married her to him and Mohammed gave her four hundred dirhams.[20] Zaynab's mother was Umayma d. Abdul Muttalib. Abdul Muttalib was the grandfather of Mohammed, making Zaynab, Mohammed's first cousin.[21] It is also an indisputable fact among Muslim historians that Abu Talib's son, Ali married his first cousin once removed, Fatima, the daughter of Mohammed.[22]
The Koran even explicitly allows Mohammed to marry his cousins in 33:50, the verse is as follows:

**يا أيها النبي إنا أحللنا لك أزواجك اللاتي آتيت أجورهن وما ملكت يمينك مما أفاء الله عليك وبنات عمك وبنات عماتك وبنات خالك وبنات خالاتك اللاتي هاجرن معك وامرأة مؤمنة إن وهبت نفسها للنبي إن أراد النبي أن يستنكحها خالصة لك من دون المؤمنين قد علمنا ما فرضنا عليهم في أزواجهم وما ملكت أيمانهم لكيلا يكون عليك حرج وكان الله غفورا رحيما (٥٠)**

**Translation:** O Prophet, We have made lawful for thee thy wives whom thou hast given their wages and what thy right hand owns, spoils of war that God has given thee, **and the daughters of thy uncles paternal and aunts paternal, thy uncles maternal and aunts maternal, who have emigrated with thee,** and any woman believer, if she give herself to the Prophet and if the Prophet desire to take her in marriage, for thee exclusively, apart from the believers -- We know what We have imposed upon them touching their wives and what their right hands own -- that there may be no fault in thee; God is All-forgiving, All-compassionate. (Arberry)

As for the Hadiths concerning consanguineous marriages, classical Islamic scholars like Ibn al-Mulaqqin affirm that there is nothing in regards to this topic in any reliable books of Hadiths.[23] There are certain narrations that do exist, but all of these have been classified as weak and/or fabricated. One

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[20] Guillaume, A. (Trans.), (1955), *The life of Muhammad: A translation of Ibn Ishaq's Sirat Rasul Allah* (p. 793). Oxford University Press.
[21] Ibn Saʿd, M. (1995), *The Women of Madina* (A. Bewley, Trans.), Ta-Ha Publishers, p. 72.
[22] An-Nasa'i, *Sunan an-Nasa'i* (Vol. 4, Book 26, Hadith 3221). Dar-us-Salam.
[23] Ibn al-Mulaqqin, Al-Badr al-Munir fi Takhrij al-Ahadith wa al-Athar al-Waqiʿa fi al-Sharh al-Kabir 7/500. Retrieved from https://shamela.ws/book/5922/4500

can refer to sites like IslamQA[24], where notable scholars like Al-Albani[25] and others, classify them as unreliable.

One of the most basic principles in Islam is the fact that the lawful and forbidden have been made clear by Allah and/or Mohammed in the Koran and/or Sunnah. Following are some verses from the Koran, some Hadiths, and the commentaries by classical scholars of fiqh/tafsir which iterate what I just stated:

1. **Koran[26]:**

- 33.36: ***It is not for any believer, man or woman, when Allah and His Messenger have decided a matter, to have liberty of choice in their decision.*** *Whoever disobeys Allah and His Messenger has gone far astray.*
- 16.116: *And do not say of falsehood asserted by your tongues,* ***"This is lawful, and this is unlawful," in order to invent lies and attribute them to Allah.*** *Those who invent lies and attribute them to Allah will not succeed.*
- 7.32: ***Say, "Who forbade Allah's finery which He has produced for His servants, and the delights of livelihood?"*** *Say, "They are for those who believe, in this present world, but exclusively theirs on the Day of Resurrection." We thus detail the revelations for people who know.*
- 5.87: *O you who believe!* ***Do not prohibit the good things Allah has permitted for you****, and do not commit aggression. Allah does not love the aggressors.*
- 6.114-115: ***"Shall I seek a judge other than Allah, when He is the One who revealed to you the Book, explained in detail?"*** *Those to whom We gave the Book know that it is the truth revealed from your Lord. So do not be of those who doubt.*
- 7.157: *those who follow the Messenger, 'the Prophet of the common folk, whom they find written down with them in the Torah and the Gospel, bidding them to honour, and forbidding them dishonour,* ***making lawful for them the good things and making unlawful for***

[24] IslamQA, Question: 14080, *Marrying Relatives and the Hadith, "choose strangers for marriage",* 2023
[25] Al-Albani, *Wikipedia*
[26] Unless otherwise indicated, all Koran translations cited are taken from A. J. Arberry's The Koran Interpreted.

***them the corrupt things,*** *and relieving them of their loads, and the fetters that were upon them. Those who believe in him and succour him and help him, and follow the light that has been sent down with him -- they are the prosperers.*'

- 66.1: *O Prophet,* ***why forbiddest thou what God has made lawful to thee,*** *seeking the good pleasure of thy wives? And God is All-forgiving, All-compassionate.*
- 6.119: *How is it with you, that you do not eat of that over which God's Name has been mentioned,* ***seeing that He has distinguished for you that He has forbidden you****, unless you are constrained to it? But surely, many lead astray by their caprices, without any knowledge; thy Lord knows very well the transgressors.*
- 42.21: ***Or have they associates who have laid down for them as religion that for which God gave not leave?*** *But for the Word of Decision, it had been decided between them. For the evildoers there awaits a painful chastisement.*
- 59.7: *Whatsoever spoils of war God has given to His Messenger from the people of the cities belongs to God, and His Messenger, and the near kinsman, orphans, the needy and the traveller, so that it be not a thing taken in turns among the rich of you.* ***Whatever the Messenger gives you, take; whatever he forbids you, give over.*** *And fear God; surely God is terrible in retribution.*
- 5.3: *Forbidden to you are carrion, blood, the flesh of swine, what has been hallowed to other than God, the beast strangled; the beast beaten down, the beast fallen to death, the beast gored, and that devoured by beasts of prey - excepting that you have sacrificed duly -- as also things sacrificed to idols, and partition by the divining arrows; that is ungodliness. Today the unbelievers have despaired of your religion; therefore fear them not, but fear you Me.* ***Today I have perfected your religion for you, and I have completed My blessing upon you, and I have approved Islam for your religion.*** *But whosoever is constrained in emptiness and not inclining purposely to sin -- God is All-forgiving, All-compassionate.*

**2. Hadiths[27]:**

[27] Unless otherwise noted, all Hadith translations are taken from established online databases. Passages not available in English have been translated directly from the original Arabic.

- It was narrated that Salman Al-Farisi said: *“The Messenger of Allah was asked about ghee, cheese and wild donkeys.* ***He said: ‘What is lawful is that which Allah has permitted, in His Book and what is unlawful is that which Allah has forbidden in His Book. What He remained silent about is what is pardoned.’”***[28]
- Abu Darda reported: *The Messenger of Allah, said,* ***Whatever Allah has made lawful in His Book is lawful, and whatever He has forbidden is forbidden, and whatever He has remained silent about is a pardon, so accept the pardon from Allah.*** *For indeed Allah was never forgetful.’ Then he recited the verse: ‘And your Lord is never forgetful’ [Maryam 19:64].”*[29]
- Narrated AbuRafi': *The Prophet said:* ***Let me not find one of you reclining on his couch when he hears something regarding me which I have commanded or forbidden and saying: We do not know.*** *What we found in Allah's Book we have followed.*[30]
- Narrated An-Nu'man bin Bashir: *I heard Allah's Messenger saying,* ***Both legal and illegal things are evident but in between them there are doubtful things and most of the people have no knowledge about them.*** *So whoever saves himself from these suspicious things saves his religion and his honor. And whoever indulges in these suspicious things is like a shepherd who grazes near the Hima (private pasture) of someone else and at any moment he is liable to get in it. (O people!) Beware! Every king has a Hima and the Hima of Allah on the earth is His illegal things. Beware! There is a piece of flesh in the body if it becomes good, the whole body becomes good but if it gets spoiled, the whole body gets spoiled, and that is the heart.*[31]
- Narrated Aisha: *Allah's Messenger said, "If somebody innovates something which is not in harmony with the principles of our religion, that thing is rejected."*[32] *Ibn `Isa said: The Prophet said:* ***If anyone practices any action in a way other than our practice, it is rejected.***[33]

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[28] Ibn Mājah, *Sunan Ibn Mājah* (Vol. 4, Book 28, Hadith 3244). Dar-us-Salam. Graded *Hasan* by Al-Albani.
[29] Al-Dāraqutnī, *Sunan al-Dāraqutnī* (Vol. 3, p. 59, Hadīth 2066). Beirut: Dār al-Risālah. Graded Sahih by Al-Albani in *Silsilah al-Sahīhah*, as well as by al-Ḥākim al-Naysābūrī in his *al-Mustadrak ʿalā al-Sahīhayn*, with al-Dhahabī concurring with his assessment.
[30] Abu Dawud, *Sunan Abu Dawud* (Book 40, Hadith 4588). Dar-us-Salam. Graded Sahih by *Al-Albani*.
[31] Bukhari, *Sahih al-Bukhari* (Vol. 1, Book 2, Hadith 49). Dar-us-Salam
[32] Bukhari, *Sahih al-Bukhari* (Vol. 3, Book 49, Hadith 861). Dar-us-Salam
[33] Abu Dawud, *Sunan Abu Dawud* (Book 40, Hadith 4589). Dar-us-Salam. Graded Sahih by *Al-Albani*.

- Al-Miqdam ibn Ma'dikarib reported: *The Messenger of Allah, said, "I have surely been given the Quran and something similar along with it.* ***Soon, the time will come when a man will recline on his couch, saying: Only follow the Qur'an, make lawful, what you find in it, as lawful and outlaw what you find in it, as unlawful."***[34]
- It was narrated that Abu Hurairah said: "*The Messenger of Allah, said: 'Whoever is given a Fatwa (verdict) that has no basis, then his sin will be upon the one who issued that Fatwa.*'"[35]

3. **Fiqh (Jurisprudence)[36]:**

- Ibn Taymiyyah: *"**Know that the original ruling concerning all created beings, regardless of their types and the differences in their characteristics, is that they are absolutely permissible (ḥalāl mutlaq) for human beings.** They are pure, and it is not forbidden for humans to handle them, engage with them, or make contact with them. This statement represents a comprehensive principle, a general ruling, and a conclusive legal maxim of significant benefit and widespread applicability. Scholars of the Shariah rely on it in matters too numerous to enumerate, encompassing human actions and events. Its validity is supported by ten pieces of evidence from the Shariah, of which I recall some." "These evidences consist of: the Book of Allah, the Sunnah of His Messenger, and the practice of the believers, as indicated in His saying: 'Obey Allah and obey the Messenger and those in authority among you' [Qur'an 4:59], and His saying: 'Your guardian is only Allah, His Messenger, and those who believe' [Qur'an 33:6]. Following these are the methods of analogy (qiyās), reasoning by consideration (iʿtibār), approaches of personal judgment (raʾy), and enlightened insight (istibsār)."*[37]
- Al-Juday: *"The principle of the original permissibility (istishāb al-ibāhah al-aṣliyya), which is expressed in the maxim:* ***'The default ruling concerning things is permissibility,' holds that everything is permissible unless there is evidence that transfers it from this permissibility to another normative ruling. No claim of obligation***

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[34] Abu Dawud, *Sunan Abu Dawud* (Book 40, Hadith 4587). Dar-us-Salam. Graded Sahih by *Al-Albani*.
[35] Ibn Mājah, *Sunan Ibn Mājah* (Vol. 1, Book 1, Hadith 53). Dar-us-Salam. Graded *Hasan* by Al-Albani.
[36] Unless otherwise indicated, all translations of Fiqh and Tafsir texts are taken from available English sources. Passages not available in English have been translated directly from the original Arabic.
[37] Ibn Taymiyyah, *Majmūʿ al-Fatāwā* (Vol. 21, p. 535). Retrieved from: https://shamela.ws/book/7289/10940

***(wujūb), recommendation (istihbāb), prohibition (ḥarām), or dislike (karāhah) can be asserted except based on a clear text that establishes it. This principle is derived from explicit texts in the Qur'an and Sunnah and aligns with rational considerations.*** *One of the primary objectives of Islamic legislation (maqāṣid al-sharʿ) is to remove hardship. Permissibility provides choice and relieves difficulty, unlike acts that are required or forbidden, which impose a duty on the individual and may result in hardship. Since human actions are innumerable, if rulings were applied other than permissibility by default, this would lead to an endless number of obligations, which would be incompatible with the capabilities of the responsible individual (mukallaf) and contrary to divine mercy.* ***This is a fundamental principle in jurisprudence: the default ruling concerning all things is permissibility until the Shariah provides evidence to remove it from permissibility.*** *Matters that are moved from permissibility to prohibition or dislike are explicitly detailed in the Qur'an and Sunnah; they are finite and specific, and their individual cases can be systematically enumerated."*[38]

- Ibn Hazm: *"**Everything on earth, and all actions completed by humans, are permissible (ḥalāl) except for what Allah has explicitly prohibited in the Qur'an or what the Prophet (PBUH) has conveyed from Him, making clear what has been revealed. Similarly, by consensus (ijmāʿ) of the entire Muslim community, which is mandated to be followed according to the Qur'an, rulings derive their authority from clear textual evidence.*** *Therefore, if we find something explicitly prohibited by a text or by consensus, we forbid it. If no explicit text or consensus exists forbidding it, it is considered permissible by the principle of original permissibility as established in the first verse. Allah reinforces this principle in several places in the Qur'an, for example: 'O you who believe, do not forbid the good things which Allah has made lawful for you, and do not transgress; indeed, Allah does not love the transgressors' [Qur'an 5:87]. This clarifies that everything is permissible for us except what has been explicitly prohibited, and that we must not exceed the limits set by Allah. Whoever forbids something that Allah or His Messenger (peace be upon him) has not explicitly prohibited, or which consensus has not*

[38] ʿAbd Allāh Al-Juday, *Taysīr ʿIlm Uṣūl al-Fiqh* (p. 48). Retrieved from: https://shamela.ws/book/22396/44

*forbidden, has committed transgression and disobedience. Allah further explains: 'Say, "Bring your witnesses who testify that Allah has forbidden this." If they testify, do not testify with them, nor follow the desires of those who deny Our signs and disbelieve in the Hereafter, while they judge fairly concerning their Lord' [Qur'an 6:140]. This confirms that anything not explicitly prohibited by Allah or His Messenger is lawful, and no one may claim it as forbidden. Allah also commands obedience: 'O you who believe, obey Allah and obey the Messenger and those in authority among you. If you dispute over anything, refer it to Allah and His Messenger, if you believe in Allah and the Last Day; that is better and fairer in the end' [Qur'an 4:59], and clarifies in another verse: 'O you who believe, do not ask about things that, if made clear to you, would distress you. But if you ask about them when the Qur'an is revealed, they are explained to you. Allah has pardoned them; and Allah is Forgiving and Forbearing. Indeed, people before you asked about them and became disbelievers because of them' [Qur'an 5:101–102].* ***These verses indicate that what is commanded in the Qur'an or conveyed by the Prophet is obligatory to obey; disobedience constitutes sin. Conversely, matters that lack explicit textual evidence or consensus are not obligatory upon us.*** *It is therefore established that anything for which no text or consensus exists is not binding, and no one is required to follow it."*[39]

- Al-Zuhayli: *Permissibility (Ḥalāl):* ***According to Shāfiʿī, Mālik, and Aḥmad, everything is permissible unless there is evidence indicating its prohibition. According to Abū Ḥanīfa, something is permissible only if evidence demonstrates its permissibility. Many Hanafī scholars hold that the default ruling for things is permissibility.*** *Explanation: Allah has permitted many things and prohibited some, which is agreed upon. For matters about which the lawgiver is silent, without a text either permitting or prohibiting them, differences of opinion appear.* ***According to the majority, these silent matters are considered permissible,*** *whereas according to Abū Ḥanīfa, they are considered prohibited.*[40]

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[39] Ibn Ḥazm, *Al-Aḥkām fī Uṣūl al-Aḥkām* (Vol. 8, p. 13). Retrieved from: https://shamela.ws/book/10432/1274#p1
[40] Al-Zuḥaylī, *Al-Qawāʿid al-Fiqhiyya wa Tatbīquhā al-Madhāhib al-Arbaʿa* (Vol. 1, p. 190). Retrieved from: https://shamela.ws/book/21786/184

- Ibn Ḥajr: ***“Matters are lawful by default, unless the Sharia states otherwise”***[41]
- Yusuf al-Qaradawi: ***The first asl (Asl, plural usual, denotes origin, source, foundation, basis, fundamental or principle. (Trans.)), or principle, established by Islam is that the things which Allah has created and the benefits derived from them are essentially for man’s use, and hence are permissible. Nothing is haram except what is prohibited by a sound and explicit nas (Nas denotes either a verse of the Qur’an or a clear, authentic, and explicit sunnah (practice or saying) of Prophet Muhammad.*** *These are the two main sources of Islamic law, i.e., its Shari’ah. (Trans.)) from the Law-Giver, Allah Subhanahu wa Ta’ala.* ***If the nas is not sound, as for example in the case of a weak hadith, or if it is not explicit in stating the prohibition, the original principle of permissibility applies.*** *The scholars of Islam have derived this principle of the natural usability and permissibility of things from the clear verses of the Qur’an.*[42]

From the evidences presented above, it is evident that:

**a) Only Allah has the ultimate authority to declare what is halal (permissible) and haram (forbidden), and Mohammed can do so only under Allah’s command.**

**b) All matters of halal and haram have been explicitly clarified for Muslims.**

**c) Islam is complete, and no individual has the authority to unilaterally declare something permissible or forbidden.**

**d) Everything is considered halal unless there is clear, unequivocal evidence from an explicit verse of the Koran or an authentic (sahih) Hadith that prohibits it.**

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[41] Ibn Ḥajar, *Fatḥ al-Bārī* (Vol. 13, p. 269). Retrieved from: https://shamela.ws/book/1673/7700

[42] THE ISLAMIC PRINCIPLES PERTAINING TO HALAL AND HARAM By Shaykh Yusuf al-Qaradawi, 2009

Since marriage between cousins is not explicitly prohibited in any Koranic verse or authentic Hadith, it is therefore considered halal under Islamic law. Consequently, no Muslim has the authority to prohibit something that Allah has explicitly permitted under Islamic law. Therefore, if any Muslim claims that an act is haram, they must provide unequivocal evidence from the Koran or an authentic Hadith to support their claim.

Now, some Muslims claim that the Hadith, 'There should be neither harm nor reciprocating harm'[43] forbids cousin marriage on the grounds that it causes harm. However, this reasoning does not hold up, and here's why:

- The text from the Koran and Sunnah does not explicitly forbid cousin marriage, and since Mohammed himself married his cousin, and his daughter, Fatima also married her cousin, and even Umar ibn al-Khattab married his cousin, Atika bint Zayd, these examples make it clear beyond doubt that cousin marriage was not regarded as forbidden, nor as inherently harmful. Had there been any true harm in it, Mohammed would neither have practiced it himself nor permitted it within his family or companions. We also have scholars explicitly permitting cousin marriage, had it been forbidden, we would not have classical scholars permitting it. Below are some examples:

a) Al-Sharbini: *The saying attributed to the Prophet : "Do not marry close relatives, for the child may be born weak (ḍāwiyan)", meaning thin or frail, due to weakness of desire, though he will come forth noble in the nature of his people.* ***Ibn al-Ṣalāḥ said: "I did not find any reliable origin for this hadith." Al-Subkī said: "Therefore, this ruling should not be affirmed since there is no proof for it. Moreover, the Prophet married ʿAlī to Fāṭimah (may Allah be pleased with them both), and she was indeed a close relative."***[44]

a) Ibn Kathir: *"And His saying, Exalted is He: 'And the daughters of your paternal uncles, and the daughters of your paternal aunts, and the daughters of your maternal uncles, and the daughters of your maternal aunts', this is a just middle path between excess and negligence. For the Christians do not marry a woman unless there are seven forefathers*

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[43] Al-Hakim, Al-Mustadrak ʿala al-Sahihayn, Hadith 2345. Classified as Sahih by Al-Hakim and Al-Dhahabi. Retrieved from: https://shamela.ws/book/2266/2439

[44] Al-Khaṭīb al-Shirbīnī, *Mughnī al-Muḥtāj ilā Maʿrifat Maʿānī Alfāẓ al-Minhāj* (Vol. 4, p. 206). Retrieved from: https://shamela.ws/book/11444/1867

*or more separating him from her. The Jews, on the other hand, permit one of them to marry his brother's daughter or his sister's daughter.* ***So this complete and pure Sharīʿah came to demolish the excess of the Christians by permitting the daughter of the paternal uncle and the paternal aunt, and the daughter of the maternal uncle and the maternal aunt. And it also came to prohibit what the Jews were negligent in by permitting the daughter of the brother or sister, and that is something terrible and repulsive.*** *And He said: 'And the daughters of your paternal uncles, and the daughters of your paternal aunts, and the daughters of your maternal uncles, and the daughters of your maternal aunts', He used the singular form for the male (uncle) due to his honor, and He used the plural form for the females due to their deficiency."*[45]

- Secondly, the Hadith, "no harm and no reciprocating harm", is a universal legal maxim (in Arabic: qāʿidah fiqhiyyah kulliyyah) and not a specific prohibition of any act. The hadith provides a general guideline to prevent causing injury to others. It does not mean that anything carrying a possible risk is automatically forbidden. The maxim is always applied within the framework of already-established Koran and Sunnah rulings. It has also been interpreted as the rulings of Islam/Sharia not causing harm or approving it. Here's a scholar proving what I just stated:

Al-Burno: *"No harm and no reciprocating harm" or "Harm must be removed." Most of those who wrote about legal maxims expressed this principle with the phrase: "Harm must be removed." They considered what we expressed, namely, the hadith, as the evidence and foundation of the rule.The hadith is an explicit text forbidding harm, because the negation with lā of generality indicates the prohibition of all kinds of harm in the Sharīʿah, since harm is a form of injustice.* ***The only exceptions are those specified by evidence, such as prescribed punishments (ḥudūd) and legal penalties. In other words, the harm and reciprocal harm that are forbidden are those done without right. As for causing harm with a valid right, that is required in Sharīʿah,*** *because it is bringing harm upon one who deserves it, such as*

[45] Ibn Kathīr, *Tafsīr al-Qurʾān al-ʿAẓīm* (Vol. 6, p. 391). Retrieved from: https://shamela.ws/book/23604/2839

*someone who transgresses the limits of Allah and is punished according to his crime, or someone who wronged another, so the wronged person demands just retribution.*[46]

The scholar makes it explicitly clear that the "harm principle" is inapplicable in situations expressly delineated by the Koran or the Sunnah.

- Thirdly, in Usul al-Fiqh, the principle is that, ***"a specific text takes precedence over a general rule if they conflict."*** That is, a clear textual ruling in revelation overrides a general maxim. In Koran 4:22–24, certain categories of close kin were explicitly forbidden for marriage, but cousins were not listed among them. The omission itself indicates their permissibility by default. Scholars stress that the special text is always prior to the general, and they also emphasize legal maxims such as ***"the default in actions is permissibility until a clear prohibition is established."*** Thus, a general maxim like "no harm" cannot overrule a direct allowance that has already been given by the Koran.[47]
- Lastly, the word darar (harm) in the hadith is defined by jurists as bringing about real, proven injury, not merely hypothetical/probable risk. That means the maxim only applies when an actual, definite harm is present. If no genetic disease is present in a given case, then no "harm" has actually occurred, and the maxim does not apply. Accordingly, the ruling of permissibility remains in force until or unless an established harm is proven. In other words, the maxim operates only when there is certain or overwhelmingly likely harm to be prevented.

From everything we have examined, it is evident that the ḥadīth 'no harm' cannot be used as a basis to prohibit cousin marriage.

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[46] Muhammad Sidqi al-Burnu, *Al-Wajīz fī Īḍāḥ Qawāʿid al-Fiqh al-Kulliyyah* [The Concise Explanation of the Comprehensive Legal Maxims of Fiqh], p. 251. Retrieved from: https://shamela.ws/book/8379/241#p1

[47] ʿIyāḍ al-Sulamī, *ʿUṣūl al-Fiqh al-ladhī lā yasaʿ al-Faqīh jahluhu* [The Principles of Jurisprudence Which a Jurist Cannot Be Ignorant Of], p. 14. Retrieved from: https://shamela.ws/book/36379/13

# 5. High-Risk Scenarios Ignored by Religious Law

I will now demonstrate certain rare but severe situations that may result from such marriages, yet Islam does not prohibit them.

**Double Cousins:** This occurs when two siblings from one family marry two siblings from another family. For example, two brothers marry two sisters. In this scenario, the children share both sets of grandparents, meaning their coefficient of inbreeding (F) is higher than in regular first-cousin marriages.

- Inbreeding coefficient (F): 1/8 (0.125) for double cousins, compared to 1/16 (0.0625) for standard first cousins.
- Genetic Risk: The risk of inheriting identical recessive alleles is 12.5%. It is double the risk of a standard first-cousin marriage.

**Marriage of two brothers to two identical twin sisters:** This refers to a situation where one pair of brothers marries one pair of identical twin sisters from another family. To understand better, let's form a scenario and then calculate the inbreeding coefficient (F) of the child in that scenario.

**Scenario:** Two brothers, A and B, marry two identical twin sisters, M1 and M2. Boy is the child of Brother A and M1. Girl is the child of Brother B and M2. We want to calculate the inbreeding coefficient of the child of Boy and Girl.

1) Contributions from fathers:
- Path through fathers to common ancestors: G1 → A → Boy → 2 generations (n_1 = 2), G1 → B → Girl → 2 generations (n_2 = 2)
- Contribution of G1 = (1/2)^2+2+1 = 1/32
- Contribution of G2 = 1/32
- Total contribution from paternal line: 1/32 + 1/32 = 6.25%

2) Contribution from mothers:
- Twin 1 & Twin 2 are identical twins, so their children (Boy & Girl) are genetically like half siblings through their mothers.
- Contribution of identical twin mothers to F_child = 1/8 = 12.5%

3) Adding both contributions:

- F_child= paternal line + maternal line
- F_child = 6.25% + 12.5% = 18.75%

| Inbreeding contribution by acenstor | |
|---|---|
| M1 | 0.125 (12.5%) |
| DAD | 0.03125 (3.125%) |
| MOM | 0.03125 (3.125%) |

Hence the inbreeding coefficient in this case would be 0.1875! This level of inbreeding is higher than that of first cousins and even higher than that of uncle-niece unions, but lower than that of full siblings. Such a coefficient indicates a considerable increase in the probability of homozygosity, which may raise the risk of genetic disorders compared to less closely related unions. Now if we imagine the mothers (M1 and M2), who are identical twins, also being first cousins of the two brothers, then the inbreeding coefficient of the child would rise to 21.88% (F = 0.2188). That number is very close to what we see in a brother–sister union (25%). In simple terms, this means the child would face almost the same level of genetic risk as if their parents were siblings, making the chance of harmful recessive conditions much higher than in more distant relationships.

**Marriage of two identical twin brothers to two identical twin sisters:** This happens when two monozygotic twin brothers happen to marry two monozygotic twin sisters. Now genetically, identical twins share 100% of their DNA. So the children of these two couples, in this case, would share 50% of their genetic material, same as full siblings! Now, if these two were to marry, the inbreeding coefficient of the child would be 0.25 or 25%! That is akin to having a child with one's sister/brother.

| Inbreeding contribution by acenstor | |
|---|---|
| TWIN 1 | 0.125 (12.5%) |
| TWIN 2 | 0.125 (12.5%) |

Now if the twin brothers and twin sisters were double cousins, i.e. their fathers were brothers, that would make the inbreeding coefficient (F) of the child, 0.28125 or 28.125%! That is 3.125% higher than having a child with one's sister/brother.

The image below demonstrates the family structure and the resulting inbreeding coefficient associated with this marriage pattern.

| Inbreeding contribution by acenstor | |
|---|---|
| TWIN | 0.125 (12.5%) |
| TWIN 2 | 0.125 (12.5%) |
| GRANDPA | 0.015625 (1.5625%) |
| GRANDMA | 0.015625 (1.5625%) |

| Family tree | | | | |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |
| CHILD | SON | TWIN | DAD | GRANDPA |
| | | | | GRANDMA |
| | | | MOM | NN_3_G4 |
| | | | | NN_4_G4 |
| | | TWIN 2 | DAD 2 | GRANDPA |
| | | | | GRANDMA |
| | | | MOM 2 | NN_7_G4 |
| | | | | NN_8_G4 |
| | DAUGHTER | TWIN | DAD | GRANDPA |
| | | | | GRANDMA |
| | | | MOM | NN_11_G4 |
| | | | | NN_12_G4 |
| | | TWIN 2 | DAD 2 | GRANDPA |
| | | | | GRANDMA |
| | | | MOM 2 | NN_15_G4 |
| | | | | NN_16_G4 |

**Cross-Generation Intermarriage within Extended Families:** When two extended families repeatedly intermarry over generations, the same pool of genes circulate within the families. This process is called a "cross marriage loop." For example, a child from Family A may marry a cousin from Family B. Later, their descendants again marry cousins or relatives from the same two families, rather than marrying outside the group. Genetically, this is significant because each such union increases the inbreeding coefficient (F). As F rises over successive generations, the risk of homozygosity for harmful recessive genes increases, potentially leading to a higher chance of congenital disorders or other genetic conditions.

**Consanguinity in small isolated populations:** In small, endogamous populations, the gene pool is limited, meaning that genetic variants, including rare harmful alleles, are more likely to be shared across individuals. This is caused by the **founder effect**[48] and **genetic drift**[49], which can increase the frequency of such variants compared with large, outbred populations. When consanguineous unions such as cousin marriages occur, loops are created in the family tree. These loops increase the probability that offspring will inherit identical segments of DNA from a common ancestor. The combination of a small gene pool and repeated cousin marriage greatly raises the chance that two copies of the same deleterious allele will meet in a child, resulting in higher rates of autosomal recessive disorders.

**Example:** If a few families move to an isolated island, and some of them carry a rare gene for a disorder, that disorder might become common on the island, even if it was very rare in the original larger population. For example, a study carried out  in 2024, highlights how cultural practices such as consanguinity and endogamy in Arab communities lead to a higher prevalence of autosomal recessive disorders, as these mutations are more likely to be inherited in homozygous form.[50]

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[48] *Founder Principle,* Encyclopedia Britannica
[49] *Genetic Drift,* Encyclopedia Britannica
[50] Marafi, Dana; *Founder mutations and rare disease in the Arab world,* Disease models & mechanisms vol. 17,6 (2024)

The image below shows some of the most common ancient genetic mutations found in Arab populations.

**Table 1. Select list of common ancient Arab founder mutations**

| Gene involved | Founder variant | Name of disease/syndrome/disorder (OMIM#) | Arab countries with reported cases |
|---|---|---|---|
| *ACADVL* | NM_000018.4:c.65C>A;p.(Ser22Ter) | acyl-CoA dehydrogenase very long chain (VLCAD) deficiency (#201475) | Palestine, Saudi Arabia |
| *ADAT3* | NM_138422.1:c.382G>A;p.(Val128Met) | Neurodevelopmental disorder with brain abnormalities, poor growth and dysmorphic facies (#615286) | Palestine, Saudi Arabia, United Arab Emirates (UAE)/Yemen |
| *CA2* | NM_000067.2:c.232+1G>A;p.(?) | Osteopetrosis, autosomal recessive 3 (#259730) | Kuwait, Palestine, Saudi Arabia, Tunisia, UAE |
| *CYP1B1* | NM_000104.3:c.182G>A;p.(Gly61Glu) | Primary open angle, congenital, juvenile, or adult-onset glaucoma 3A (#231300) | Kuwait, Lebanon, Morocco, Oman, Palestine, Saudi Arabia |
| *CYP1B1* | NM_000104.3:c.1103G>A p.(Arg368His) | Primary open angle, congenital, juvenile or adult-onset glaucoma 3A (#231300) | Kuwait, Palestine, Morocco, Oman, Saudi Arabia |
| *DCAF17* | NM_025000.4:c.436delC;p.(Ala147HisfsTer9) | Woodhouse-Sakati syndrome (#241080) | Saudi Arabia, Qatar, Palestine, Tunisia, Kuwait, and Bahrain |
| *GJB2* | NM_004004.5:c.35delG;p.(Gly12ValfsTer2) | Autosomal recessive deafness type 1A (#220290) | Algeria, Egypt, Jordan, Lebanon, Morrocco, Palestine, Saudi Arabia, Tunisia, UAE |
| *GNE* | NM_001190384.2:c.2228T>C;p.(Met743Thr) | Nonaka myopathy (#605820) | Kuwait, Palestine, Saudi Arabia |
| *MICU1* | NM_001195518.1:c.547C>T;p.(Gln183Ter) | Myopathy with extrapyramidal signs (#615673) | Oman, Qatar, Saudi Arabia, Kuwait |
| *SLC19A3* | NM_025243.4:c.1264A>G;p.(Thr422Ala) | Biotin-thiamine-responsive basal ganglia disease (#607483) | Kuwait, Oman, Saudi Arabia, Syria, Yemen |
| *SLC26A3* | NM_000111.2:c.559G>T;p.(Gly187Ter) | Congenital secretory chloride-losing diarrhea 1 (#214700) | Kuwait, Palestine, Saudi Arabia, UAE |
| *TBCE* | NM_003193.5:c.155_166del;p.(Ser52_Gly55del) | Sanjad-Sakati syndrome (#241410) | Kuwait, Saudi Arabia, UAE, Qatar, Bahrain, Oman, Jordan, Palestine, Tunisia, Morocco, Egypt |

OMIM, online Mendelian inheritance in man. Further details of these founder mutations can be found in the Catalogue of Transmission Genetics in Arabs (CTGA) database (Tadmouri et al., 2006).

# 6. Conclusion: A Call for Awareness

If Islam is truly a divine system meant for all times, guided by an all-knowing God, then one might expect it to forbid practices that are clearly harmful. Yet cousin marriages and other close-family unions remain explicitly allowed. Even with modern genetic knowledge showing potential risks, especially when such marriages are repeated over generations, the religion sets no blanket prohibition. This shows that what is considered halal or haram is not based on harm alone, but on what Allah has specifically permitted or forbidden. Any attempt by humans to declare these unions forbidden has no authority without clear evidence from the Koran or authentic Hadith. If Allah truly were all-knowing, especially about human biology and genetics, He would not permit practices that knowingly increase the risk of serious genetic disorders. The allowance of cousin marriages despite the clear hereditary risks casts doubt on the claim of Allah being omniscient in matters that directly affect human well-being.

**Concluding Remarks:**

This work has looked at the genetic effects of cousin marriages in Islamic contexts, using both classical Islamic sources and modern genetics. I have tried to be as accurate as possible, but still as a fallible human, I might have made some errors or missed some points. If you have any suggestions, comments, or criticisms, I would greatly appreciate it if you could let me know via my email (bullseye55@protonmail.com) or Instagram (https://www.instagram.com/bullseye__00). This work is meant to contribute to a better understanding of the topic and encourage thoughtful discussion on the intersection of religion and genetics. My intention is not to demean or show disrespect toward any holy figure or religion.